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Microwave Oven Cleaner

Field of the Invention

This invention relates general to a device and method that cleans microwave ovens through a chemical action, specifically to an agent that is placed into the microwave, and then activated by operating the oven for a period of time.

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Summary of the Invention

The instant invention is a cleaning device consisting (in its simplest form) of an open cell container used to hold a non-toxic aqueous solution that may contain surfactant(s) such as Tergitol 15-S-9, d-limonene and/or an emulsifier such as ethoxylated-soybean oils. Details are provided below. The method of use is to place the device into the microwave oven which is then turned on for approximately five minutes, followed by period of an additional five minutes when the oven door remains closed, allowing the solution to penetrate the caked-on material. The door is then opened. Food residues which previously held aggressively to the oven may be thoroughly wiped clean with a soft sponge or towel. Many residues fall off. The invention works impressively well.

There are three factors to the efficaciousness of the invention. 1) The vapor phase of the solution created by heating the oven has a direct effect of softening the residue by steaming. 2) the surfactant is born by the vapor phase of the solution to the residue at any location in the oven, where it bonds to any remaining oils 3) the "cool-down" period allows the solution to leave the vapor phase and penetrate more deeply into the residue, also carrying surfactant deeper inside. The result is a highly efficacious, low cost, non-toxic microwave cleaning method. The volume of solution used for a cleaning must be sufficiently small so that it will boil for a predominance of the on-time of the oven (during cleaning), in the range of 40 - 70 ml.

The proposed surfactants are non-toxic, making the invention completely safe in the event any residues are left after the cleaning process, or even if a child

were to accidentally drink the solution.

Scent such as lemon or pine may be added to produce a pleasant smell. Antibacterial compound may be added without degrading the effectiveness of the process.

Several embodiments are disclosed for the open-cell container including: a simple cup with a tear-off membrane seal; a sponge that is soaked with the solution; an integrated cup and sponge with a tear-off cover; and an integrated cup and sponge in which the solution is released by penetrating the sponge.

Brief Description of the Drawings

FIG. 1 shows a section through a microwave oven cleaner device made of a cup with a tear-off membrane seal with the cleaner solution.

FIG. 2 shows a microwave oven cleaner device with the solution in a sponge.

FIG. 3 shows a section through a microwave oven cleaner device including a cup with a tear-off membrane seal and an integral clean-up sponge.

FIG. 4 shows a section through a microwave oven cleaner device including a cup with a cut through membrane seal and an integral clean-up sponge.

Detailed Description of the Drawings

FIG. 1 shows the solution 10 in a disposable cup 20 with a tear-off membrane seal 24. To open tear tab 27. A gelatinous material 26 prevents damage to the microwave if solution 10 is boiled away well before heating cycle ends, preventing damage to the oven.

The preferred solution for this embodiment contains approximately 96% water, 2% d-limonene and 2% ethoxylated-soybean oils, by volume (ingredients available from Florida Chemical Co.) D-limonene is a non-toxic lemon scent that also enhances performance due to its surfactant properties. Another embodiment uses a blend surfactant, such as a 1% solution containing 40% Tergitol 15-S-9 and 60% Tergitol 15-S-15, (available from Union Carbide in an aqueous base.) A non-blend embodiment uses Triton X301, also from Union Carbide. Antibacterial agents such as triclosan or sodium hypochlorite or other additives, such as ammonia, are also obvious to include as an option.

FIG 2 shows solution 10 soaked in a sponge 30 with a plastic handle 32 attached by prongs that penetrate the sponge 30. The sponge is packaged in such a way to prevent drying of the sponge 30 (i.e. plastic wrap found on traditional single wrapped sponges). The sponge would be removed from bag just prior to using. Once the solution has been activated by heating by the microwave and allowed to stand for a few minutes, sponge 30 is then used to wipe the oven clean. The device may also be produced with the surfactant in the sponge and sold in a dehydrated state, reducing weight to save on shipping cost. The product would be wetted prior to use. Heavy surfactants, such as d-limonene or Tergitol, are not volatile and therefore can

be used in the solution 10 of this embodiment. The handle may be omitted.

FIG. 3 shows a disposable cup 20 with a tear-off membrane seal 24 containing the solution 10 and a sponge 20 integrated into the back of the cup 20.

FIG. 4 shows a sponge 30 attached to the open face 31 of disposable cup 20. A cut through membrane 25 lies between sponge 30 and disposable plastic cup 20. The product may be opened with a fork or knife plunged into sponge 30 and through membrane 25. This allows the sponge to be wetted with a solution that may be volatile, such as ammonia, yet stored. The container may be shaped as a handle. A heavy surfactant can be used in the solution 10 in this embodiment.

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